

DAVIS (W. E. B.)

*Om*

Operative Procedures in Acute  
General Suppurative  
Peritonitis.

BY ✓

W. E. B. DAVIS, M. D.,

BIRMINGHAM, ALA.,

Surgeon to Birmingham Hospital of United Charities;  
Secretary of the Southern Surgical and Gynecological  
Association; Fellow of the American Association of  
Obstetricians and Gynecologists; Member of the  
Jefferson County (Birmingham) Board of Medical Ex-  
aminers; Secretary of the Surgical Section of the  
American Medical Association, etc.

DUP.

REPRINTED FROM

*The New York Medical Journal*

*for April 4, 1891.*





*Reprinted from the New York Medical Journal  
for April 4, 1891.*

## OPERATIVE PROCEDURES IN ACUTE GENERAL SUPPURATIVE PERITONITIS.\*

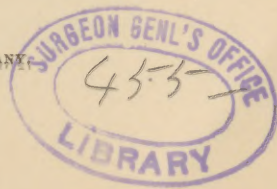
By W. E. B. DAVIS, M. D.,

BIRMINGHAM, ALA.,  
SURGEON TO BIRMINGHAM HOSPITAL OF UNITED CHARITIES;  
SECRETARY OF THE SOUTHERN SURGICAL AND GYNÆCOLOGICAL ASSOCIATION;  
FELLOW OF THE AMERICAN ASSOCIATION OF  
OBSTETRICIANS AND GYNÆCOLOGISTS;  
MEMBER OF THE JEFFERSON COUNTY (BIRMINGHAM)  
BOARD OF MEDICAL EXAMINERS;  
SECRETARY OF THE SURGICAL SECTION OF THE AMERICAN MEDICAL ASSOCIATION,  
ETC.

THAT there may be no confusion over the terms septic and suppurative peritonitis as used in this paper, it may be well to state that it is conceived that their aetiology is the same, and that every septic peritonitis would become suppurative if time permitted, for both are due to the same microbe. Many cases of septic peritonitis are cut short by the power of the organism to take up the germs and destroy them. In other cases the infection is so profound that death is produced in a few hours from toxæmia, before there has been any collection of fluid in the peritoneal cavity; still others die from hæmorrhagic peritonitis in from twelve to forty-eight or even seventy-two hours, before the fluid has become purulent; but, when life is prolonged till after seventy-two hours, and sometimes after forty-eight

\* Read by invitation before the Medical Society of the State of New York at its eighty-fifth annual meeting.

COPYRIGHT, 1891, BY D. APPLETON AND COMPANY.



hours, the fluid in the cavity will be purulent. In the language of Senn,\* "In the septic variety death results before the pus microbes have had time to produce their specific pathogenic effect on the histological elements which are destined to become converted into pus-corpuscles."

When quarts and gallons of pus are reported as having been removed from the general peritoneal cavity and recovery followed, I believe that the pus has usually resulted from a local collection which has ruptured into the general cavity, and the operation has been done before sufficient time had elapsed for this amount of pus to result from the septic inflammatory process in the general cavity. It is easy to understand how a gallon of pus which has been shut off from the general cavity by inflammatory exudations and adhesions, and which has only recently ruptured into the peritoneal cavity, can be removed and recovery follow; and it is not difficult to comprehend how this condition might be mistaken for acute general suppurative peritonitis, with a gallon or a quart of pus as a result in the cavity, as the pus, by its irritating properties, will produce an inflammation which would be misleading; but the condition is quite different from what would be had if the *pus* had been the result of a general inflammation. True, there would be many grave symptoms, but not that extensive local inflammation and fatal toxæmia which would result from a peritonitis which had existed long enough to give rise to so large a quantity of free pus in the cavity.

Pathological and clinical study, combined with bacteriological and experimental research, has demonstrated conclusively that by the time a general peritonitis has become purulent there have resulted such destructive local effects and so profound a general infection that the condition must be considered fatal.

\* *Principles of Surgery.*



The physiological and pathological peculiarities of the peritoneal sac in comparison with other serous cavities, as stated by Hadra,\* will explain this rapidly fatal result, as "there is a greater power of resorption, and likewise of secretion and transudation, in the former, which is not only due to the large area of surface, but also to the force under which the fluid contents are pressed into the lymphatic system by the respiratory movements of the diaphragm, and also by intestinal peristalsis." Therefore, with such a system of resorption, there should be no surprise that our patients often die from septic peritonitis in a few hours, and long before the peritoneal fluid has become purulent.

Those who have had much experience with septic peritonitis can appreciate the statement of Hutchison, that "it is almost impossible to exaggerate our conception of the wild-fire rapidity with which inflammation of the serous membranes may extend whenever an adequate cause has been supplied"—the most important fact to remember in the treatment. Experiments on animals and the many cases of peritonitis in the human subject which I have been permitted to see, twelve, fifteen, twenty, thirty-six, forty-eight, and seventy-two hours after the inception of the disease, leave no doubt on this point. I will refer briefly to only a few cases.

At the Birmingham Charity Hospital I operated twelve hours after a stab of the abdomen which perforated the bowel in four places. Peritonitis had involved one half of the cavity, the side on which the injury was received. The intestines on this side were very much inflamed and tympanitic.

Some months ago I saw a case with my brother, in which he opened the abdomen fifteen hours after the man

\* *Transactions of the Southern Surgical and Gynecological Association*, 1889.

had been shot. There had been considerable escape of fæces into the cavity, and peritonitis was quite extensive.

In 1889 I saw, with Dr. Wyman, at the Charity Hospital, a man who had been shot in the abdomen about twenty hours previously. He was moribund and we did not operate. He died four hours after I saw him—twenty-four hours after the injury—and the autopsy revealed a general hæmorrhagic peritonitis.

During the same year I assisted Dr. Wilson, at the Jefferson County Hospital, in an operation for gunshot wound of the abdomen thirty-eight hours after the injury, and there was a very intense hæmorrhagic peritonitis which involved all the abdominal viscera.

If these cases teach anything, it is that delay in operation in perforating wounds of the intestines will allow a septic peritonitis to develop which can not be relieved by surgery, and that to wait for symptoms in penetrating wounds of the abdomen is to wait for diffused septic peritonitis—which is death.

I could report many cases of peritonitis from perforation of the bowels, or from the emptying of the contents of an abscess into the cavity, or from perforation of the appendix, and from other causes, to illustrate its rapid development and fatal termination, but this is not necessary, even though the length of this paper would permit of it, for the experiments of Pawlowsky, Grawitz, Wegner, and others, who have made acute septic peritonitis the subject of very careful study, leave but little to be added in that direction.

Another and very important cause of septic peritonitis is a simple inflammation which, by producing inflammation of the intestinal wall, renders it permeable to pathogenic micro-organisms, "which are always present in the intestinal

canal,"\* and which pass through the weakened intestinal walls into the peritoneal cavity and cause death from septic peritonitis. This is well illustrated in cases of obstruction of the bowel, when the violent peristalsis on the proximal side of the occlusion results in an intense venous engorgement, with transudation and exudation into the paravascular tissues, and explains why the mortality in late operations for obstruction is always so high. Hence in diffuse septic peritonitis there is a double source of infection—the one from the general cavity, and the other from the septic germs which pass through the walls of the intestine, owing to the pathological conditions produced in the tissues of the bowel from the inflammation. Therefore it is not sufficient to remove the source of infection from the cavity, but, if possible, the contents of the intestines, in order to get rid of gas and fluids which contain septic germs, and to relieve the distended, paralyzed guts, which give rise to grave pressure symptoms—symptoms which often resemble obstruction of the bowel from mechanical causes, but which are due to dynamic disturbances.

It is often very difficult to make a diagnosis of general peritonitis, for in the great majority of cases it is a secondary disease, and is greatly modified in its symptoms by the original trouble. The symptoms may be almost completely veiled by other grave conditions. The change in symptoms from a perityphlitic abscess, or a puerperal purulent pelvic peritonitis, is often gradual and not very pronounced. But of all the difficulties, the free use of opium furnishes the greatest—all symptoms are masked, and the physician and family led to believe the patient better and the condition not serious.

Of the local symptoms, pain comes first. It is nearly always present, and it is the severe excruciating pain which

\* *Intestinal Surgery*, Senn.



first attracts attention. When the pain is local at the beginning, it is of very great diagnostic value as to the cause of the inflammation. Pain, however, is not always present, and I have seen the gravest cases lying comfortable—cases in which the infection was most profound; but where there is present, in connection with pain, rigidity of the abdominal walls, distention of the abdomen and general tenderness, vomiting and eructation of gases, with marked constitutional symptoms—rapid thready pulse, some elevation of temperature, etc.—there can be but little doubt of the existence of general peritonitis; and if there is no recognizable cause, free purgation will, as a rule, show whether it is simple or septic.

I have often seen cases where the diagnosis could not be made with any reasonable degree of certainty because morphine had been given freely, and there was no evidence that the peritonitis was not a simple inflammation. These cases are so frequent that too much stress can not be laid on the importance of withholding opium until after a diagnosis has been made. Only recently I saw a very sad case of this kind in the family of one of our most prominent physicians.

I was sent for thirty-six hours after a girl, eighteen years of age, had been taken with pain in the abdomen, which had been pretty well controlled by morphine. Her pulse was 120, temperature  $102.5^{\circ}$ , and there was some rigidity of the abdominal muscles, with general tenderness. She evidently had peritonitis, but I could not say that it was septic, and advised the use of colomel in large doses and enemas of glycerin and salts, and directed the attending physician to let me know in twelve hours the result of the treatment, that an operation might be done if there was not very marked improvement. I received no message that night, but on the following morning I found a note saying that she had been purged and was better; this was Wednesday morning. On Thursday morning I received a simi-



lar message, but in the evening I was sent for and found her suffering very great pain, with a temperature of  $104^{\circ}$ , pulse 140, and in a dying condition. There was no doubt then about the diagnosis, but an operation could not have offered any chance of recovery, and while the half dozen physicians present urged me to operate, the mother of the girl was opposed to it unless we could offer more hope of saving her. An autopsy could not be had; but the attending physician informed me that a large quantity of pus came out through the undertaker's trocar.

On a close examination of the physician on my last visit I found that the improvement had never been so much as I had been led to believe, and that the tympanites, tenderness, and rigidity of the abdominal muscles had never disappeared. Had I seen the case twelve hours after my first visit I should have advised an operation. If morphine had been withheld in this case and salines given instead, the diagnosis would have been made early and the patient in all probability saved.

Of course many cases of simple peritonitis will get well without treatment, and opium may relieve the pain, but it always subjects the patient to the danger of septic inflammation and to obstruction of the bowels from adhesions, and too, in many cases, destroys every vestige of chance for the patient, as the diagnosis will thus be obscured and an operation not resorted to in time.

In the beginning of a general peritonitis, when the bowels are tympanitic, I begin by giving a tablespoonful of salts in half a glass of water and direct that the dose be repeated every hour until the patient is freely purged. This treatment is especially indicated in the threatened peritonitis we so often meet after laparotomies. I have seen the symptoms of a beginning peritonitis promptly cut short by the administration of a few concentrated doses of salts or of calomel in from one to three-grain doses repeated

hourly. As has been stated, the purgative treatment of peritonitis frequently proves a very valuable diagnostic measure. If it does not succeed, we know that an operation is generally indicated. I have seen this treatment succeed a number of times when I was confident that a laparotomy would be necessary. It is very important not to resort to the free use of morphine unless an operation has already been decided on.

In acute septic peritonitis, as met with in childbed fever or after perforation of the bowels, or from the emptying of the contents of an abscess into the cavity, or after operative procedures or accidental traumatism, such as gunshot wounds, stabs, etc., nothing short of an abdominal section can afford any chance of recovery, and this will not offer much prospect unless done very early.

Dr. Price, Dr. Wylie, and others, in this country, have taken a decided stand for early operative interference in this class of cases. Montgomery \* says laparotomy is especially indicated by advanced tympanites and effusion. Barwell contented himself with washing and sponging out the cavity in a case of suppurative peritonitis without drainage; but Treves, Truc, Price, and the majority of operators favor drainage and irrigation as conditions require. In perforative peritonitis Escher and Truc would limit the performance of laparotomy to the cases of traumatic origin, as "the adhesive inflammation can not be relied upon to limit the escape of the contents of the viscus." As the patient is healthy and the tissues in good condition, they think in these cases an operation not only possible, but advisable. But they think that "in pathological conditions the adhesive inflammation can render more valuable service, as the patient is usually too exhausted from disease to

\* *Transactions of the American Association of Obstetricians and Gynecologists*, 1888.

stand a protracted operation, and as the softened condition of the tissues gives no guarantee of a closure." Hence they would not operate in perforation due to typhoid, dysenteric, and tubercular ulcers. Mears says:\* "Surgical interference is not justifiable and should not be instituted in cases of typhoid fever in which perforation occurs when the infective process is at its height. In mild cases of the disease in which the pyrexia has not been of high grade and in which the perforation occurs at the end of the third week or later, when the stage of convalescence is fully pronounced, laparotomy may be performed."

There is no want of results to show that operations, when done early, are of benefit, but, on the contrary, late operations are universally fatal, for, as Hadra has said, "well-developed acute septic peritonitis, as a rule, may be considered fatal, with or without surgical interference." In view of the fatality of this disease, he advocated "open treatment, † a full exposure of the abdominal cavity, which should be maintained until the danger has passed by. . . . As much of the omentum and of the bowels as find no ready room inside should be left resting on the surface." He claims that by this method "the cavity would be sufficiently cleansed and kept dry, the bowels to a great extent excluded, the exchange of poisonous materials diminished, the bowels, peritoneum, and all the other involved organs relieved of pressure. . . . Suction by the peritoneal and diaphragmatic lymph organs would at once be greatly counteracted." He says that the irritation of the dressings over the patient's abdominal organs need not be dreaded, as "we possess in the gutta-percha tissue a nearly ideal non-irritative, air and germ tight material."

\* *Transactions of the American Surgical Association*, 1888.

† *Transactions of the Southern Surgical and Gynecological Association*, 1889.

In the discussion of Dr. Hadra's paper I stated that I would adopt his method in my next case, but, after a thorough study of his operation, I was convinced that it would not meet the indications for treatment so completely as the plan which I suggested a year ago at the Alabama Medical Association, and which "will allow of the complete exposure of the abdominal cavity, the removal of the cause of inflammation, and assist in restoring the functions of the intestines."

The abdomen should be opened in the median line if the seat of the causative trouble can not be found; the cause, if found, removed; the cavity thoroughly douched with hot water; all adhesions broken up; and, if tympanites is not marked, drainage-tubes are introduced, through which the cavity may be washed out as indications require. If the cause be found in the region of the cæcum, the drainage-tubes should be introduced through a second incision in the right iliac region.

In those cases in which tympanites is marked, causing pressure on all the abdominal organs, and thus creating much constitutional trouble, it will require special attention, and upon this point I desire to lay great stress, for this condition is a dangerous one of itself. Not only does the weakened intestinal wall permit of the continued passage of septic germs into the peritoneal cavity and afford constant infection, but it must be remembered that the bowel can not be replaced without great pressure and consequent traumatism, which will often kill in a few hours from shock thus induced. In advanced cases of peritonitis it must always be remembered that the walls of the intestines are rendered inactive by inflammation, and the power of contraction can not be restored until the inflammation is relieved; and hence the bowel will continue tympanitic and the exchange of septic germs kept up, unless this condition is remedied.



Depaul punctured the intestine with a fine hollow needle in cases of tympanites with dangerous pressure symptoms, and this has been recommended by many of the leading writers up to this time; even Senn refers to this as a procedure which may be resorted to. This has been tried by me a number of times, and I was never able to see an appreciable decrease in the tympanites, and it is not reasonable to suppose that a paralyzed bowel could expel any quantity of gas through a needle. I have also practiced making incisions into the bowel after eventration, and by pressure attempted to expel the gas, but this does not prove satisfactory. I consider the best method of relieving a distended, paralyzed gut, full of poisonous gas, is to fill it with hot water, as this will not only free it of tympanites, but, in getting rid of the gas and feces, etc., prevents infection. The intestines should not be permitted to escape from the cavity, as their distention will grow greater the longer they are allowed to remain unsupported by the abdominal walls. The tunics being inflamed, the intestines are completely paralyzed and can not expel their contents when incised on the outside of the abdomen; and hence this should be done with the bowels on the inside, that they may be compressed by the abdominal walls. From the time the abdomen is opened a competent assistant should begin to break up adhesions and to direct a strong stream of hot water into all parts of the cavity, while the operator incises the intestine and washes it out. It may be necessary to make more than one opening in the bowel. Before beginning the operation the stomach should be thoroughly washed and the colon freed of its contents.

In those cases where the symptoms resemble obstruction of the bowel from mechanical causes, after the bowel has been emptied and, if possible, washed thoroughly, an arti

ficial anus should be formed. The whole procedure can be accomplished in a remarkably short time.

Recently I operated on a young man five days after a perforation of the appendix. His physician tried to relieve him with opium and poultices for four days, and then diagnosticated the case to be obstruction of the bowel from invagination. When I was called, the physician had begun to use purgatives and enemas, and thought that there was hope of relieving the obstruction by medicine, as the man had passed a very small quantity of feces that day. I expressed the opinion that it was a case of suppurative peritonitis, which would kill with or without operation. As the young man begged for the slightest chance an operation would promise, I opened the abdomen, incised the intestine, and allowed the escape of a large quantity of very offensive fluid and gas. At the same time, the abdominal cavity was freed from a purulent fluid by hot water, which was directed to every portion of the cavity. The incised gut was stitched to the lower angle of the abdominal wound and a drainage-tube introduced through the upper angle. The artificial anus was made in the median line that the recti muscles might aid in retaining the contents of the intestine. The patient died on the next day.

There is often an obstruction in the ileo-caecal region from adhesions produced by the inflammatory process which has caused the peritonitis, and in such cases it may be well to do an anastomosis by uniting the lower part of the ileum with the ascending colon.

In 1889 I adopted this plan in a case of suppurative peritonitis due to the rupture of a perityphlitic abscess, in which there was a compound flexion of the ileum in the ileo-caecal region from very strong adhesions. The peritonitis was well developed and the tympanites was very great. After the abdominal cavity was thoroughly irrigated and the bowel emptied of its contents, as the patient was holding up well, to avoid the necessity of resorting to the formation of an artificial anus, I requested my brother to do an anastomosis with his catgut

mats. The ileum was united with the ascending colon in a very few minutes. Three hours after the operation the patient had a small fecal action and passed a large quantity of gas. Fourteen hours after the operation he sat up in bed and died suddenly from exhaustion. Necropsy two hours after death. Abdominal wound united. Omentum adherent to wound at the points of operation and incision. The anastomosis was perfect and the adhesions extended a little beyond the line of approximation mats.

In the paper read before the Alabama Medical Association a year ago, in addition to the plan of operating suggested here, I recommended that in some cases where the artificial anus was resorted to the ileum should be flexed and an anastomosis done eight or ten inches from the seat of the proposed anus. This was recommended so that it would not be necessary to resort to a subsequent laparotomy in order to cure the artificial anus; for this could be done after the anastomosis without interfering with the flow of the intestinal contents.

Since I read that paper more extended experiments with the operation have taught me that in the cases in which it would be indicated the patient's condition would not permit of the extra time required for its performance, and hence it is now my opinion that it will be very exceptionally indicated.











REASONS WHY

## Physicians Should Subscribe

FOR

# The New York Medical Journal,

EDITED BY FRANK P. FOSTER, M.D.,<sup>1</sup>

Published by D. APPLETON & CO., 1, 3, & 5 Bond St.

1. **BECAUSE :** It is the *LEADING JOURNAL* of America, and contains more reading-matter than any other journal of its class.
2. **BECAUSE :** It is the exponent of the most advanced scientific medical thought.
3. **BECAUSE :** Its contributors are among the most learned medical men of this country.
4. **BECAUSE :** Its "Original Articles" are the results of scientific observation and research, and are of infinite practical value to the general practitioner.
5. **BECAUSE :** The "Reports on the Progress of Medicine," which are published from time to time, contain the most recent discoveries in the various departments of medicine, and are written by practitioners especially qualified for the purpose.
6. **BECAUSE :** The column devoted in each number to "Therapeutical Notes" contains a *résumé* of the practical application of the most recent therapeutic novelties.
7. **BECAUSE :** The Society Proceedings, of which each number contains one or more, are reports of the practical experience of prominent physicians who thus give to the profession the results of certain modes of treatment in given cases.
8. **BECAUSE :** The Editorial Columns are controlled only by the desire to promote the welfare, honor, and advancement of the science of medicine, as viewed from a standpoint looking to the best interests of the profession.
9. **BECAUSE :** Nothing is admitted to its columns that has not some bearing on medicine, or is not possessed of some practical value.
10. **BECAUSE :** It is published solely in the interests of medicine, and for the upholding of the elevated position occupied by the profession of America.

Subscription Price, \$5.00 per Annum. Volumes begin in January and July.

